

REMARKS

Claims 1, 4-7, and 14-18 are in the application for further consideration. Withdrawn claims 9-13 have been canceled to expedite the passage of this patent application to allowance. Claim 1 has been amended to recite a minimum peel strength as disclosed on p. 7, l. 13-16. Peel strength is determined in accordance with ASTM D 413 (p.10, l. 19-21). New claim 14 recites the metal powder concentration range disclosed on p. 7, l. 16-17). New claim 15 recites the metal powders and amount disclosed in Example 1 and new claim 16 recites one of these metal powders. New claim 17 recites the unstable condition of the copolymer, which means that the copolymer contains at least 80 unstable end groups/ 10^6 carbon atoms (p. 16-19). Example 2 discloses that the unstabilized copolymer/metal powder composition has better adhesion (peel strength) than the stabilized counterpart. New claim 18 recites the non-adhesion of the copolymer by itself as shown in Example 1.

Reconsideration of the rejection of claims 1and 4-8 based on Wu in view of '593 and favorable consideration of new claims 14-18 is respectfully requested in view of the amendment to claim 1 and the discussion to follow.

The present invention as embodied in claim 1 involves the discovery that a particular PFA copolymer, tetrafluoroethylene/perfluoro(ethyl vinyl ether) copolymer, has substantially greater adhesion as a rotolining to the interior of a steel vessel than tetrafluoroethylene/ perfluoro(propyl vinyl ether), when the small amount of adhesion promoting, non-bubble promoting metal powder is present in the composition. These copolymers can be called TFE/PEVE and TFE/PPVE, respectively. TFE/PPVE had been the only commercially available PFA copolymer until TFE/PEVE was discovered, only recently (p. 2, l. 27 to p. 3, l. 5).

As disclosed on p. 1 of the present application, Scheirs discloses that PFA (TFE/PPVE) does not form an adhered rotolining. Instead, the rotolining of PFA is held in place by mechanical interlock by the article being rotolined. Example 1 of the present application discloses that neither TFE/PPVE nor TFE/PEVE adhere to the steel test panel. Wu' disclosure of Wu's tetrafluoroethylene copolymer microspheres for both rotolining and rotomolding (col. 5, l. 39-40) is not in disagreement with the non-adhesion of tetrafluoroethylene copolymer when PFA as indicated by the fact that the same polymer is used for rotolining and rotomolding. Rotomolding requires that there be no adhesion between the lining and the mold so that the rotomolding can be removed from the mold. Claim 1 now recites a minimum peel strength of 25 lb/cm so as to distinguish the non-adherence of the copolymer by itself from the surprising effect of the small amount of the metal powder in imparting adhesiveness to the copolymer.

Example 1 of the present application discloses the TFE/PEVE-metal powder composition achieving a peel strength more than 2x that of the TFE/PPVE-metal powder composition, both compositions containing only 0.5 wt% Zn, and that similar improvement is obtained when the Zn is replaced by copper or tin powder. Example 2 compares the adhesion when the TFE/PEVE is stabilized and unstabilized, both containing 1 wt% Zn. All of the peel strengths exhibited by the compositions of the present invention in Examples 1 and 2 exceed the 25 lb/in minimum peel strength now recited in claim 1. The peel strength when the metal powder content is increased from 1 wt% to 5 wt%, falls to 14 lb/in (Example 2), which is less than this minimum value.

Wu discloses a special coagulation process to produce microspheres that are shown by the Wu Examples to produce bubble-free rotomoldings (col. 10, 56-57 and col. 11, l. 26-27. '593 discloses 0.1 to 30 wt%, preferably 5 wt%, of a fine powder additive to a fluororesin such as PFA to suppress bubble formation, the fine powder additive being an inorganic powder or metal powder such as glass, silicon, zinc, aluminum, copper and the like.

The invention of claim 1 is unobvious and therefore patentable over the combination of Wu/'593 for the following reasons:

1. Neither W nor '593 disclose or suggest that a small amount of non-bubble promoting metal powder will impart adhesion to PFA as a rotolining and in particular that the adhesion effect is much greater for TFE/PEVE than TEF/PPVE. In the absence of knowledge of the present invention, one skilled in the art does not learn from Wu/'593 how to improve the adhesion of TFE/PPVE in rotolining and that using TFE/PEVE instead of TFE/PPVE leads to this improvement.
2. The effect of the fine powder additive to suppress bubbles in '593 provides no motivation to incorporate any of these additives into Wu, because the Wu microspheres already solve the bubble problem by providing bubble-free rotomoldings without the need for any additive.
3. Independent of 1 and 2, non-obviousness is also indicated by the surprisingly greater adhesion obtained when TFE/PEVE is used in place of TFE/PPVE. In this regard, surprising results are part of the claimed invention "as a whole" (35 U.S.C. 103(a)) and indicative of patentability, In re Soni, 34 USPQ2d 1684, 1687 (Fed. Cir. 1995), In re Chupp, 2 USPQ2d 1437, 1439 (Fed. Cir. 1987).

In overriding these indicia of non-obviousness, the rejection commits errors in (A) concluding the adhesive effect is inherent in '593, (B) relying on the inherent effect to construct the obviousness rejection, (C) treating the disclosure of TFE/PEVE in Wu as though claim 1 was claiming just TFE/PEVE, and (D) not giving unobviousness effect to the unexpected results of the claimed invention.

Re. (A) The Office Action dated April 28, 2008 assumes the metal powder of '593 inherently functions to improve adhesion (section A.v.) The latest office action incorrectly builds on this erroneous assumption of inherency by relying on the In re Rose condemnation of combining old elements, as though improved adhesion was an old element from '593. Improved adhesion is not disclosed in '593. Therefore it is not an old element. The unreasonable effect of the assertion of lack of novelty of improved adhesion as part of the obviousness rejection is to require that one skilled in the art not only be informed of the disclosure of this reference, but to have worked it as well to uncover an undisclosed effect.

The disclosure of '593 is not an inherent disclosure of improved adhesion. For inherency, the claimed subject matter at issue must necessarily be present in the prior art description, Continental Can Co. v. Monsanto Co., 20 USPQ 1746, 1749 (Fed. Cir. 1991). '593 discloses no specific composition within the scope of claim 1 to be considered for inherency. Instead, '593 has broad disclosure with respect to amounts and identity of the fine powder, with no suggestion that the amount should be 0.2 to 2 wt% and within this narrow composition range, the fine powder should be a metal powder, and not an inorganic powder and when a metal powder, one that is adhesion promoting and does not cause bubbles such as does the '593 aluminum in this small amount. Considering the scope of the '593 disclosure, the assumption of inherency is at best speculative, not satisfying the legal requirement that the inherency must necessarily be present.

Re. (B) Inherency is not a proper basis for concluding obviousness. As stated in In re Spormann and Heinke, 150 USPQ 449 (CCPA 1966):

"As we pointed out in In re Adams, 53 CCPA 996, 356 F.2d 998, 148 USPQ 742, the inherency of an advantage and its obviousness are entirely different questions. That which is inherent is not necessarily known. "Obviousness cannot be predicated on what is unknown". (p. 452)

Even when inherency is present, if not made obvious by the prior art disclosure, such inherency is not a proper basis for concluding obviousness. Thus, in Kloster Speedsteel AB v. Crucible Inc., 230 USPQ 81, (Fed. Cir. 1986), it was admitted that

the process of the '518 patent obtained the carbon particle size change uniformity recited in the claim at issue, but this inherency was not obvious from the '518 disclosure, leading the Court to state:

"That argument [inherency] is unpersuasive when confronted by Stora's failure to establish at trial that the inherency would have been obvious to those skilled in the art when the invention of claim 4 was made. Inherency and obviousness are distinct concepts." (p. 88)

It is not obvious from the '593 disclosure that any of the fine powders disclosed in any amount would have any effect on adhesion of the fluoroelastomer to the vessel surface being lined. It is therefore improper to incorporate '593 into Wu on the basis of alleged inherency in '593

Re. (C) The rejection refers to the Wu disclosure of TFE/PEVE (col. 2, l. 46-48) as though this was dispositive of the question of obviousness. Applicant is not claiming just TFE/PEVE, but is claiming the combination of this copolymer with a small amount of adhesive promoting, non-bubble promoting metal powder to obtain an adhesive effect not disclosed in either Wu or '593. The Wu disclosure of TFE/PEVE in Wu is in the context of disclosure of five classes of TFE comonomers, encompassing hundreds of possibilities (col. 2, l. 37-67). Nothing in Wu says "take me" with respect to TFE/PEVE, especially in light of the Wu preference for TFE/PPVE when the TFE comonomer is PFA (col. 3, l. 32-36). Nothing in Wu or '593 suggests that non-bubble promoting metal powders in small amounts give a much better adhesion result with TFE/PEVE than TFE/PPVE. It is only hindsight from knowledge of the claimed invention that leads the rejection to the Wu disclosure of TFE/PEVE as the TFE copolymer of choice to obtain an improved adhesive effect.

Re. (D) The rejection criticism of the unexpected results disclosed not being commensurate with the scope of the claims, overlooks both the scope of the claim 1 and the disclosure of unexpected results. The criticism views 0.2 to 2 wt% as being broad, when it should be apparent that on an absolute basis, 0.2 to 2 wt% is a very small concentration range. The criticism further states that superior results are demonstrated only for 1 wt% Zn powder. Example 1 demonstrates unexpected results for 0.5 wt% Zn, Sn, and Cu. Even the identity of the metal powder in claim 1, as being adhesion promoting and non-bubble promoting is not of great breadth, in that it covers only those metal powders that provide the claimed effects. The added requirement that the adhesion minimum be 25 lb/in provides further definition of the

of the metal powder, which is fully supported by the disclosure of unexpected results for Zn, Sn, and Cu.

MPEP 716.02(d) allows for predictability of results to claim a broader range than actually shown. Examples 1 and 2 of the present application fully support the scope of the metal powder and its amount recited in claim 1.

As is claim 1 commensurate in scope with the showings of unexpectedness in the present application, so are a number of other dependent claims, as follows:

- claims 4, 5, and 6 reciting specific metal powders
- claim 14 reciting the 0.3 to 1.3 wt% metal powder range
- claim 15 reciting specific metals in a specific amount
- claim 16 reciting a specific metal and a specific amount

Claim 7 is unobvious and therefore patentable on the same basis as claim 1. The disclosure in '593 of the bubbles adhering to the particles of fine powder so as to release them to the outside (surface) of the lining [0017] suggests that the dispersion relationship of fine powder in the fluororesin is not achieved.

Claim 8 is additionally patentable by reciting the stabilization of the TFE/PEVE. The rejection considers that the purpose of the stabilization is to increase shelf life and considers this to be a different purpose and another advantage that nevertheless does not bestow patentability on this claim. The advantage of shelf life while imaginative is groundless. The question is whether stabilization of the TFE/PEVE component of a composition for forming an adherent rotolining is obvious. It is not.

New claim 17 recites that the TFE/PEVE is unstabilized. Example 2 discloses that the unstabilized TFE/PEVE in the composition gives a better adhesion result than the stabilized TFEPEVE counterpart, a result that is not expected.

Both claims 8 and 17 are unobvious and therefore patentable on the same basis as claim 1. Claim 17 is unobvious on the additional basis of the unexpected improvement in adhesion obtained when the TFE/PEVE is unstabilized.

Claim 18 is added to recite the non-adhesion of the copolymer by itself to give a contrast between the minimum peel strength of 25 lb/in for the composition and lack of adhesion by the TFE/PEVE copolymer by itself.

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In view of the foregoing, allowance of the above-referenced application is respectfully requested.

Respectfully submitted,

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